

# Claims

- [c1] 1. A worm drive system providing for precision pointing, motion and tracking about an axis of revolution various types of implements including astronomical telescopes and LIDAR systems, said worm drive system being comprised of a plate assembly supporting in precise method a hub assembly which includes a worm gear and a clutch mechanism, a worm assembly which features a pivot point for said worm assembly and includes a worm supported by precision bearings, and a motor assembly which includes a motor.
- [c2] 2. The hub assembly defined in claim 1, featuring said clutch mechanism which includes design means for maintenance of precise coaxial alignment of said worm gear relative to the axis of said hub assembly, includes means for adjustment of the action of said clutch mechanism, and includes design means of said clutch mechanism to prevent warpage of said worm gear during said adjustment of the action of said clutch mechanism.
- [c3] 3. The hub assembly defined in claim 1, featuring design means for easy attachment to and removal from the implement to which said hub assembly is attached.

- [c4] 4. The worm assembly defined in claim 1, featuring design means for maintaining a relatively constant preload of said precision bearings which support said worm, thereby preventing excessive wear within said precision bearings or development of internal play within said precision bearings due to said wear.
- [c5] 5. The worm assembly defined in claim 1, said pivot point located on a line tangent to the point of contact between said worm and the worm gear defined in claim 1, thereby preventing uneven wear from occurring to the teeth said worm gear, said worm gear possibly being supported by means other than that described in claim 1.
- [c6] 6. The worm assembly defined in claims 1 and 5, featuring means of maintaining constant engagement of said worm to said worm gear, via said pivot point, whether said worm rotates in clockwise or counterclockwise fashion, thereby allowing said worm to continuously lap into said worm gear during use and improving the precision of the invention over time.
- [c7] 7. The worm assembly defined in claim 5, featuring design means of balancing said worm assembly about said pivot point, thereby preventing torque produced by

gravity or acceleration and movement of the implement to which said worm assembly is attached, from affecting the alignment of said worm to said worm gear.

- [c8] 8. The motor assembly defined in claim 1, featuring design means of attachment to the plate assembly defined in claim 1, such that the axis of said motor and the axis of said worm are located in a plane that is perpendicular to the axis of said worm and said point of contact defined in claim 5, said motor being coupled to said worm by a tensioned belt and two pulleys, such that the tensioned belt does not affect the alignment of said worm relative to said worm gear defined in claim 5.
- [c9] 9. The motor assembly defined in claim 1, featuring design means of preventing said motor from affecting the alignment of said worm relative to said worm gear.
- [c10] 10. The plate assembly defined in claim 1, featuring design means for precise adjustment of the worm assembly defined in claim 6 relative to the worm gear defined in claim 5.
- [c11] 11. The plate assembly defined in claim 1, featuring design means of fixing the position of said plate assembly relative to the implement to which said plate assembly is attached, thereby allowing the axial rotation of the worm

defined in claim 1, via action of the motor defined in claim 1, to precisely rotate the hub assembly defined in claim 1 and therefore the implement about the implement's axis of revolution.